

REMARKS

The indication of the allowability of Claims 5 and 20 is acknowledged with appreciation.

It respectfully is requested that the subject matter of presently solicited Claims 1 to 20 be reconsidered. For the reasons indicated hereafter each of these claims respectfully is urged to be in condition for allowance.

The continued rejection of Claim 6, 7, 9, 10 and 12 under 35 U.S.C. §112, second paragraph, would be inappropriate. The suggestions for the amendment of these claims as kindly presented by the Examiner at Pages 2 and 3 (top) of the Official Action have been implemented. The withdrawal of the rejection is urged to be in order and is respectfully requested.

The continued rejection of presently solicited Claims 1 to 4, 9 to 12, 14, 15, and 17 to 19 under 35 U.S.C. §102(e) over the different teachings of U.S. Patent No. 6,985,200 to Miyachi et al. would be lacking sound technical and legal bases. It respectfully is pointed out that Miyachi et al. never discloses or remotely suggests a liquid crystal device in which the orientation of the side chains of the surface director alignment layer and the liquid crystal bulk layer are directly controllable by an electrical field via dielectric coupling. See Applicant's Specification at Page 5, lines 5 to 10, where "directly controllable by an applied electric field" is discussed. This indicates that the initial orientation will be affected such as enhanced or switched as a direct consequence of the applied electric field. Hence the term "directly controllable by an electric field via dielectric coupling" means that the initial orientation will be affected as a result of the dielectric coupling between the electric field and the molecule (*i.e.*, the side-chains of the surface director alignment layer

and the liquid crystal bulk layer). In dielectric coupling between a liquid crystal molecule and an electric field, response is quadratic to the field, *i.e.*, the orientation change of the director is dependent on the direction of the electric field, but not on the sign of the electric field. When there is a dielectrical coupling between a liquid crystal molecule and an electrical field, the director of the liquid crystal molecules aligns to the electrical field. In a typical display device where the liquid crystal molecules are arranged between two mutually opposite substrates and the electrical field is arranged across the display from the first substrate to the second substrate, this dielectric coupling allows so-called out-of-plane switching of the liquid crystal molecules.

Miyachi et al. contemplates a different liquid crystal device comprising a first and second substrate, a liquid crystal layer arranged between the substrates, electrodes arranged between the liquid crystal layer and the first and second substrates, respectively, and a first and second switching layer provided between the electrodes and the liquid crystal layer on opposite sides of the liquid crystal layer. Hence, according to the teachings of Miyachi et al. the electric field is applied over the liquid crystal layer and the first and second switching layers in a direction essentially along the normal to the substrates. In Miyachi et al. at Col. 4, lines 13 to 16, it is stated:

Each of the first and second switching layers preferably includes molecules that change their orientation directions in response to a voltage applied between the first and second electrode layers.

From this passage one skilled in the art is left without a clue as to what way the orientation is changed in response to this voltage. An explanation of the switching

change contemplated by Miyachi et al. is provided at Col. 4, lines 23 to 27 where it is stated:

In one preferred embodiment of the present invention, the molecules included in each of the first and second switching layers preferably change their orientation directions in a plane that is defined parallel to the surfaces of the first liquid crystal layer.

Throughout Miyachi et al. no other type of switching than the switching in the plane of the surface of the first liquid crystal layer, *i.e.* switching in the plane perpendicular to the applied electrical field, is ever contemplated.

Miyachi et al. discusses alternatives for molecules in the first and switching layers that have the property of switching in a plane perpendicular to the electrical field including liquid crystal material exhibiting a smectic phase. See, Col. 4, lines 53 to 55 where it is stated:

In an alternative preferred embodiment, the liquid crystal material included in the first and second switching layers may exhibit at least one of ferroelectricity, antiferroelectricity and ferrielectricity.

Accordingly, Miyachi et al. never mentions any other type than in plane-switching molecules as being suitable for the switching layer, and the teachings of Miyachi et al. should be characterized as being limited to switching layers exhibiting switching in a plane perpendicular to the electrical field. It is known to those skilled in the art that the time constant for ferroelectric, antiferroelectric or ferrielectric coupling is much lower than the time constant for dielectric coupling. Hence, if there is any such coupling between the applied electric field and switching liquid crystal molecules, this will be the effect that controls the orientation of the liquid crystal molecules. Upon the application of an electrical field between the substrates of Miyachi et al., the

orientation of the switching layer is controlled by ferroelectric coupling, and hence the orientation of the switching layer is not directly controllable via dielectric coupling.

At Pages 4 (bottom) and 5 (top) of the Official Action it is acknowledged "Miyachi fails to disclose the sign of the dielectric anisotropy of the surface-director alignment layer...." Hence, Miyachi et al. never discloses any orientational change of the switching layer that would be due to dielectrical coupling to the electric field. In summary, the orientation of the in-plane switchable layer of Miyachi et al. is not directly controllable by dielectric coupling as presently claimed by Applicants.

It is well established law that patentability is negated under 35 U.S.C. § 102 only when the prior disclosure is identical to the invention sought to be patented. Each and every element of the claimed invention must be disclosed in a single reference in complete detail. See Akzo N.V. v. United States ITC, 808 F.2d 1471, 1 U.S.P.Q.2d 1241 (Fed. Cir. 1986); Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986); Rolls-Royce Ltd. v. GTE Valeron Corp., 800 F.2d 1101, 231 U.S.P.Q. 185 (Fed. Cir. 1986); Kloster Speedsteel AB v. Crucible Inc. 793 F.2d 1565, 230 U.S.P.Q. 81 (Fed. Cir. 1986); Great Northern Corp. v. Davir Core & Pad Co., 782 F.2d 159, 228 U.S.P.Q. 356 (Fed. Cir. 1986); In re Donohue, 766 F.2d 531, 226 U.S.P.Q. 619 (Fed. Cir. 1985); W.L. Gore & Assoc. v. Garlock, Inc. 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983); SSIH Equip S.A. v. United States ITC, 713 F.2d 746, 218 U.S.P.Q. 678 (Fed. Cir. 1983); and Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 U.S.P.Q.2d 1913 (Fed. Cir. 1989). The withdrawal of the rejection is urged to be in order and is respectfully requested.

Finally, the continued rejection of presently solicited Claims 6 to 8, and 16 under 35 U.S.C. § 103(a) over the different teachings of U.S. Patent No. 6,985,200 to Miyachi et al. in view of the deficient teachings of U.S. Patent No. 5,973,817 to Robinson et al. would be lacking sound technical and legal bases. Basic shortcomings of the primary reference are previously discussed. Independent Claim 1 was not subject to the present rejection, and each of Claims 6 to 8, and 16 incorporate the subject matter of Claim 1. Robinson et al. is devoid of information that is capable of remedying basic deficiencies of Miyachi et al. Even if the diverse teachings of the references were somehow combined, Applicants' specifically claimed contribution still would not result or otherwise be rendered obviously apparent.

It respectfully is submitted that a *prima facie* basis for the obviousness of the presently claimed subject matter respectfully is absent in the reasonably derived teachings of the references. To establish *prima facie* obviousness of a claimed invention, all of the claim limitations and their combination must reasonably be taught or suggested in the prior art. They are not. See in this regard M.P.E.P. § 2143.3 citing In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in the claim must be considered when judging the patentability of the claim against the prior art". In re Wilson, 424 F.2d 1342, 165 USPQ 494 (CCPA 1970). The withdrawal of the rejection is urged to be in order and is respectfully requested.

If there is any remaining point that requires clarification prior to the allowance of the Application, the Examiner is urged to telephone the undersigned attorney so that the matter can be discussed and promptly resolved.

Respectfully submitted,

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